

ing muscle. In grade IV lesions, all soft tissues are destroyed, with involvement of bone and vital structures. Wound infection is the most common complication, and osteomyelitis is frequently associated with full-thickness sores. In general, grade I and II ulcers are treated by local wound therapy and freedom from pressure. Grades III and IV often require surgical intervention. Repositioning and specialized air or foam mattresses as well as improving overall physical condition are important to patients with all grades.

The mainstay of established ulcer therapy is the provision of a pressure-free environment in concert with local wound care and serial surgical debridement to eliminate necrotic tissue and decrease the bacterial load. This may often be done at the bedside with simple instruments. Local anesthesia is seldom required. Ancillary factors requiring attention include adequate nutrition, the relief of continued spasticity, and the control of urinary and fecal incontinence. Psychosocial concerns, such as non-compliance, lack of self-care, and an inability to direct one's own care, must be addressed with both the family and the patient through intensive counseling and education. Antibiotic therapy is indicated only on evidence of infection—cellulitis, osteomyelitis, leukocytosis, fever, or bacteremia. Topical pharmacologic agents, such as hydrogen peroxide, povidone-iodine, and mafenide acetate, are adjuncts to be used with caution to avoid inhibiting healing by local toxicity.

Surgical closure for reasons of patient comfort, practicality, and long-term prevention are effective in more severe conditions. In some patients, such as those who are chronically ill or bedridden with multisystem disease or limited life expectancy, treatment goals may be to provide comfort rather than cure.

Numerous new wound care dressings have appeared to enhance the wound repair process in acute and chronic wounds. Well-designed controlled clinical trials are needed to differentiate between the beneficial effects of increased attention to the overall care of patients, including wound management, and the alleged salutary effects of the various dressing materials. The proper use of occlusive dressing in grade I and II ulcers can increase patient comfort and enhance healing.

There has been a shift in the past ten years toward an increasing use of muscle flap coverage for grade III and IV ulcers, which has decreased the number of operations and reduced the time to complete healing. Wound healing can now be enhanced by applying topical growth factors such as fibroblast growth factor B. The results of early clinical trials are encouraging in patients with large ulcers after surgical options have been exhausted. Electrical stimulation and biologic implants are other advanced experimental forms of therapy that may become more accessible and efficacious. Electrical stimulation has also been applied to treat secondary complications, including contracture, spasticity, deconditioning due to lack of exercise, and muscle atrophy.

LAWRENCE L. KETCH, MD
Denver, Colorado

REFERENCES

- Alvarez OM, Childs EJ: Pressure ulcers—Physical, supportive, and local aspects of management. *Clin Podiatr Med Surg* 1991; 8:869-890
- Anthony JP, Huntsman WT, Mathes SJ: Changing trends in the management of pelvic pressure ulcers: A 12-year review. *Decubitus* 1992; 5:44-47, 50-51
- Bar CA: Evaluation of cushions using dynamic pressure measurement. *Prosthet Orthot Int* 1991; 15:232-240
- Young JB, Dobrzanski S: Pressure sores: Epidemiology and current management concepts. *Drugs Aging* 1992; 2:42-57

Laser Treatment of Skin Lesions

LASERS ARE USEFUL in the management of numerous disease processes including hemangiomas, nevi, benign and malignant skin neoplasms, and tattoos. When laser light is shown on living tissue, one or more of the following tissue reactions occur: reflection, scattering, transmission, or absorption. Tissue vaporization results from the absorption of light delivered with sufficient energy. The laser can produce a hemostatic incision, vaporize undesirable substances and tissue at the operative site, and coagulate blood vessels.

Capillary hemangiomas of infancy have been successfully treated using either the argon or the neodymium:yttrium-aluminum-garnet (Nd:YAG) laser. It appears that the laser treatment of capillary hemangiomas of infancy produces a loss of surface vascularity, arrested growth, and early regression when compared with no therapy. Although treatment results from the Nd:YAG laser are superior to those of the argon laser, the incidence of complications is higher.

Patients with port-wine stains also respond well to laser treatment. In these cases, the argon laser seems to yield the best results. Young children have been thought not to be good candidates for laser treatment due to scarring created by the therapy. Recent evidence suggests, however, that 60% of children younger than 13 years have good to excellent results.

Many other lesions respond favorably to laser treatment. The argon laser successfully treats telangiectasias and venous lakes. Deep capillary or cavernous hemangiomas and those of the oral cavity may be best managed using the Nd:YAG laser. Tattoos can be removed by the carbon-dioxide laser, although some scarring of the overlying skin usually occurs.

Benign cutaneous pigmented lesions (actinic lentigines, senile lentigo, and café au lait spots) may be removed using the pulsed dye laser with the restoration of a nearly normal skin tone. A biopsy of a pigmented skin lesion to establish the diagnosis is necessary before initiating therapy.

THOMAS R. STEVENSON, MD
Sacramento, California

REFERENCES

- Achauer BM, Vander Kam VM: Strawberry hemangioma of infancy: Early definitive treatment with an argon laser. *Plast Reconstr Surg* 1991; 88:486-489
- Apfelberg DB (Ed): *Atlas of Cutaneous Laser Surgery*. New York, NY, Raven Press, 1992
- Brauner G, Shliffman A, Cosman B: Evaluation of argon laser surgery in children under 13 years of age. *Plast Reconstr Surg* 1991; 87:37-43
- Vedung S, Atterhem H: Argon laser treatment of port-wine stains: The patient's evaluations of the results. *Plast Reconstr Surg* 1992; 90:430-435

ADVISORY PANEL TO THE SECTION ON PLASTIC SURGERY

ROGER P. FRIEDENTHAL, MD

*Advisory Panel Chair**CMA Council on Scientific Affairs Representative
San Francisco*

W. GRANT STEVENS, MD

*CMA Section Chair**Marina Del Rey*

LESLIE M. HOVEY, MD

*CMA Section Secretary**San Jose*

STEPHEN H. MILLER, MD

*CMA Section Assistant Secretary**La Jolla*

ROBERT A. HARDESTY, MD

Loma Linda University

STEPHEN SCHENDEL, MD, DDS

Stanford University

THOMAS R. STEVENSON, MD

*Section Editor**University of California, Davis*

JOHN O. STRONG, MD

University of California, Irvine

WILLIAM W. SHAW, MD

University of California, Los Angeles

JACK C. FISHER, MD

University of California, San Diego

STEPHEN J. MATHES, MD

University of California, San Francisco

JOHN REINISCH, MD

University of Southern California

JACK G. BRUNER, MD

*California Society of Plastic Surgeons
Sacramento*

ROBERT SINGER, MD

*California Society of Plastic Surgeons
La Jolla*

EDWARD V. HENJOJI, MD

*California Society of Plastic Surgeons
Westlake Village*

ANGELO CAPOZZI, MD

*St Francis Memorial Hospital
San Francisco*